

Department of Environmental Quality

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June 27, 2005

Eric Blischke & Chip Humphrey EPA, Region 10 811 SW Sixth Avenue Portland, Oregon 97204

Kathy Ivy EPA, Region 10 ECL-111 1200 Sixth Ave Seattle, WA 89101

Re:

Linnton Oil Fire Training Facility, Intersection of NW Marina Way & St Helens Road, Portland,

Oregon

ECSI No. 1189 (River Mile 3.5)

Dear Eric, Chip, & Kathy:

The Oregon Department of Environmental Quality (DEQ) completed our review of site investigations conducted by the City of Portland Bureau of Environmental Services (BES) on the former Linnton Oil Fire Training facility located on the east bank of the Willamette River at approximately River Mile 3.5. The site is about 500 feet from the Willamette River. DEQ determined that the Linnton Oil Fire training facility does not appear to be a current or future source of contamination to the Willamette River, and no additional Source Control Evaluation or Source Control Actions are needed.

Please review our draft Source Control Decision supported by the attached memo and provide comments within 30-day of receipt of this letter (August 5, 2005). If you have any questions regarding DEQ's draft Source Control Decision for this facility, please contact me at 503-229-6825 or Tom Gainer, DEQ Project Engineer, at 503-229-5326.

Sincerely.

James M. Anderson, Manager Portland Harbor Section

Attachments:

1) DEQ's June 20, 2005 File Memo

cc: Tom Gainer, DEQ/NWR





State of Oregon

Department of Environmental Quality

Memorandum

To:

ECSI File #1189

Date: June 20, 2005

From:

Tom Gainer, Project Manager

Tom Roick, Peer Review

Subject:

Portland Harbor Source Evaluation and Proposed Conditional No Further Action

Linnton Oil Fire Training Facility

Portland, OR

The Oregon Department of Environmental Quality (DEQ) completed review of site investigations conducted by the City of Portland Bureau of Environmental Services (BES) on the former Linnton Oil Fire Training Grounds (LOFTG) Site located at the intersection of NW Marina Way and St. Helens Road approximately ½ mile north of the Linnton District of Portland (Figure 1). The site is about 500 feet from the Willamette River, and is located at approximately River Mile 3.5 within the Portland Harbor Superfund Site. Based on review of the documents, DEQ has determined that the LOFTG Site does not appear to be a current source of Portland Harbor river contamination. Because the LOFTG Facility does not appear to be a current source of Portland Harbor contamination, no additional investigation or source control measures are necessary unless additional information becomes available in the future which indicates that the LOFTG Site is a current source of Portland Harbor contamination. Furthermore, DEQ proposes to issue a Conditional No Further Action (NFA) determination for the site.

Upland Site Background

The LOFTG property is owned by the Bonneville Power Administration (BPA) and serves as a right-of-way for high-tension power lines. Beginning in 1951, the City of Portland leased the property from BPA for fire training purposes. Fire Training operations occurred through 1988. During the oil fire training exercises, petroleum products were pumped to various props, ignited, and extinguished. The petroleum products were obtained from area businesses. Unburned products infiltrated into the ground or ran into a drainage ditch along the southern property boundary. The Remedial Investigation detected petroleum and chlorinated solvents in soil to 16 feet below ground surface. In addition, groundwater was also found to be contaminated with petroleum related compounds, pentachlorophenol (PCP), and chlorinated solvents.

A Remedial Investigation and Feasibility Study (RI/FS) was completed for the site in November 1995. In May 1996, the Director of DEQ signed a Record of Decision (ROD). Key elements of the identified remedy included:

- Treatment of petroleum contaminated soil through excavation and thermal desorption;
- Pretreatment of chlorinated solvent contaminated soil through biodegradation;

- On-site disposal of treated soils;
- Groundwater monitoring to confirm the effectiveness of the soil remedy; and,
- Institutional controls to prevent exposure to residual contamination.

In August 1996, an Intergovernmental Agreement was signed between DEQ and the City of Portland for implementation of the remedy. The Remedial Action was implemented in 1998 whereby the majority of contaminated soil above a depth of 8 feet was removed (Figure 2), treated and replaced at the site. Semi-annual groundwater monitoring of 12 wells (Figure 2) was conducted from November 1999 through October 2004 to assess the effectiveness of the remedy and attenuation of groundwater contaminant concentrations. Institutional controls restricting subsurface excavation and groundwater use were established on August 11, 2003 to ensure that the remedy remains protective.

DEQ recently completed review of two potential contaminant pathways to the Willamette River: groundwater and surface water (i.e., storm water).

Groundwater Pathway

Depth to groundwater ranges from about 2 to 21 feet below ground surface and flow is northeast towards the Willamette River (Figure 2). Based on groundwater monitoring results conducted at the subject site (Tables 1-4 and Figures 3-6) and trend analyses presented in the Five-Year Review Report, DEQ has determined that groundwater contaminant plumes are generally stable or decreasing in size and concentration. The leading edge of the plume is over 600 feet from the Willamette River and does not appear to be advancing towards the river (Figure 7 shows location of downgradient monitoring wells relative to the Willamette River). The deed restriction prevents human exposure to site groundwater. Therefore, the remedy described in the ROD has been successfully implemented.

Groundwater constituents that exceeded human health-based screening levels in the October 2004 monitoring event include: PCP, benzene, vinyl chloride, 1,1-dichloroethene, and arsenic. Screening for ecological receptors is not appropriate since the plume is stable and a significant distance from the Willamette River. Lack of migration and continued natural attenuation of contaminants will be confirmed by annual groundwater monitoring with five-year reviews.

Surface Water Pathway

Discovery of a surface water drainage culvert from the subject site on to the adjacent undeveloped BPA property prompted an investigation in 2003-2004 of the surface water drainage pathway to the Willamette River. BES submitted analytical results for 16 soil samples collected along the drainage pathway (Table 5 and Figure 7), which showed that the contaminant distribution of PCP and polycyclic aromatic hydrocarbons (PAHs) along the surface water pathway is limited in extent and was adequately defined.

Of the four soil samples collected in the vicinity of the surface water pathway discharge to the Willamette River, only one sample slightly exceeded the Portland Harbor 1 mg/kg Probable Effects Concentration (PEC) sediment screening level for PCP at a concentration of 1.08 mg/kg and the bioaccumulation sediment screening level of 0.37 mg/kg. PCP was not detected in an adjacent sample, or in samples located immediately upstream within the drainage ditch and downstream at the river waterline. While several other soil samples exceeded the sediment bioaccumulation screening levels for PCP and benzo(a)pyrene, they are located about 1,000 feet from the river and significant transport in this diffuse drainage pathway is not expected. These data indicate that there does not appear to be a significant current source of PCP near the Willamette River that exceeds the toxicity and bioaccumulation screening levels. Only one of the 16 soil samples exceeded the PCP screening levels for terrestrial ecological receptors or residential human receptors. Therefore, PCP generally does not appear to pose significant risk to these potential receptors.

All detected PAH concentrations were significantly less than the Portland Harbor PEC and terrestrial ecological screening levels.

Conclusions

Based on review of the file, DEQ has made the following conclusions:

- 1. <u>Groundwater:</u> Contaminant plumes at the subject site are generally stable or decreasing in size and concentration. The leading edge of the plume is over 600 feet from the Willamette River and does not appear to be advancing towards the river. The deed restriction prevents human exposure to site groundwater. Therefore, the remedy described in the ROD has been successfully implemented.
- 2. <u>Surface Water:</u> Soil analyses indicate a complete pathway from the site towards the river, but residual PCP concentrations are below screening levels and source control measures are not necessary at this time.
- 3. The upland site does not appear to be a current source of contamination to the Willamette River.

Recommendations

- Submit this site for US EPA and trustee review in the Portland Harbor program.
- Issue a conditional NFA letter for the upland subject site, with the conditions being annual groundwater monitoring and continued maintenance of the deed restriction.

LOFTG File Memo Page 4 of 4

Project Submittals

Surface Water Pathway Soil Results, January 26, 2004 and August 2, 2004 Semi-Annual Groundwater Monitoring Reports, 1999 to 2004 Five-Year Review Report, April 15, 2005

Attachments: Five Tables

Seven Figures

Table 4 |
Total Petroleum Hydrocarbons Detected in Groundwater
Linnton Oil Fire Training Grounds
Portland, Oregon

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				nwest Fest N					EPAN	viethod .	EPA Method
Well Number &	SECTION	GD (mg/	D)	Gx(mg/L)		Dx	(mg/L)		28015M	(mg/ls)	418.1 (mg/L)
Sample Date			Heavy		#6 Fuel		100	ineavy only		24.00	
	Cass.	Diesels	oHeavy Oil	J.G	COIL	Diesela	Kerosene	Heavy Oil/ Motor Oil	Ças v	Dreselv	F TECT TO T
MW-1						I					
Jun-93						} <u></u>			<1.0	<2.5	NA
Dec-93					}	}		}	<1.0	<2.5	NA
Nov-99	<0.25	DET	DET	0.12		<0.25		<0.500			
Apr-00	<0.25	DET	< 0.63	NA		2.68		1.00			
Oct-00	<0.25	DET	DET	NA		3.33		0.637	j]	i
Oct-00 (Dup)	<0:25	DET	DET	NA		3.55		0.686	l]	
Apr-01	NR	NR	NR	0.165		4.82	<u></u>	1.25			
Oct-01	NR	NR	NR	0.148		5.61		1.14	}]	
Apr-02	NR	NR	NR	0.169	- <i>-</i>	4.05		0.898			
Oct-02	NA	NA	NA	<0.08		4.90	}	<0.500			
Apr-03	NA	NA	NA	0.218		3.13) <u></u>	<0.500			
Oct-03	NA	NA	NA	<0.08		2.47		<0.500			
Apr-04	NA	NA	NA	0.0881		2.98		0.793			
Oct-04	NA	NA	NA	<0.08	<2.00	5.64	<1.00	<2.00			
MW-2											
Jun-93									3.0	<2.5	NA
Jun-93 (Dup)									4.1	2.8	NA
Dec-93									<1.0	<2.5	NA
Dec-93 (Dup)]	<1.0	<2.5	NA
Nov-99	DET	DET	<0.63	1.94		1.71		<0.500			
Apr-00	DET	DET	<0.63	3.86		2.52		<0.500			.
Oct-00	DET	DET	<0.63	1.51		NA		NA			 -
Apr-01	NR	NR	NR	3.45		5.12		<0.500			
Oct-01	NR	NR	NR	1.1		4.11		<0.500			·
Apr-02	NR	NR	NR	2.07		6.01		0.516			
Oct-02	NA	NA	NA	1.61		3.61		<0.500			
Apr-03	NA	NA	NA	1.47	~-	2.39		<0.500			
Apr-03 (Dup)	NA	NA	NA	1.51		2.20		<0.500			
Oct-03	NA	NA	NA	1. <i>7</i> 5		2.56		<0.500			
Apr-04	NA	NA	NA	2.17		6.34		0.539			
Oct-04	NA	NA_	NA	1.42	<2.00	3.04	<1.00	<2.00			
MW-4											
Oct-04	NA	NA	NA	<0.08	<0.500	0.251	<0.250	<0.500	<u> </u>		

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Table 41
Total Petroleum Hydrocarbons Detected in Groundwater
Linnton Oil Fire Training Grounds
Portland, Oregon

			TATE OF THE	iwest-Test-I			200 (0.00)			lethod:	EPA Method
WelliNimber@ -SimpleDate	A H	CID (mg/	E) 212 12	(Gx(mg/4L)		(*) (DX:	(mg/E);			V-6/-	(1831/mg/a)
	· Cas	Diesel	illeavvi	Ges.	#6 ruel	ग्रीहर्व	Kerosene	Heavy Oil/ Moior Oils	GE S	Diesel .	Heav Oil
			(QI)		CUL			WOODE WILL			
<u>MW-5</u>	ł	}			ļ	}	1	ļ		_	
Jun-93							}		<1.0	<2.5	NA
Dec-93									<1.0	<2.5	NA
Nov-99	<0.25	DET	DET	<0.08		<0.25		<0.500			
Apr-00	<0.25	DET	<0.63	NA		2		0.81			·
Oct-00	<0.25	DET	DET	NA	[1.71		<0.500	(
Apr-01	NR	NR	NR	<0.08	[·	2.66		0.717			
Oct-01	NR	NR	NR	0.084		1.84	'	<0.500			
Oct-01 (Dup)	NR	NR	NR	NR		1.95		0.708			
Apr-02	NR	NR	NR	<0.08		2.44		0.556			~-
Oct-02	NR	NR	NR	<0.08		2.26		<0.500		ļ _l	
Oct-02 (Dup)	NA	NA	NA	<0.08		2.43		<0.500	- -		~-
Apr-03	NA	NA	NA	0.0913		2.72		<0.500			
Oct-03	NA	NA	NA	<0.08		1.58		<0.500		- <i>-</i>	
Apr-04	NA	NA	NA	<0.08		1.44		<0.500			 .
Oct-04	NA	NA	NA	<0.80	<2.00	3.08	<1.00	<2.00		- <i>-</i>	
Oct-04 (Dup)	NA	NA	NA	<0.80	<2.00	3.15	<1.00	<2.00			
<u>MW-7</u>											
Oct-04	NA	NA	NA	<0.80	<0.500	0.666	<0.250	<0.250	· 		
<u>MW-8</u>										· ·	
Oct-04	NA	NA	NA	0.112	<0.500	7.61	<2.50	<5.00			' ·
MW-9											
Jun-93								[<1.0	<2.5	NA
Dec-93		{	{					' Ì	<1.0	<2.5	NA
Nov-99	<0.25	DET	DET	<0.08		<0.25	`	<0.500			
Apr-00	<0.25	DET	<0.63	NA		2.3		0.61		{	
Oct-00	<0.25	DET	DET	NA		3.81		0.557			
Apr-01	NR	NR	NR	<0.08	1	4.08		0.700			
Oct-01	NR	NR	NR	<0.08		2.69		<0.500			
Apr-02	NR	NR	NR	<0.08		6.08		1.80		}	
Apr-02 (Dup)	NR	, NR	NR	<0.08		6.04		1.81]]	·
Oct-02	NA	NA	NA	NA		3.24		<0.500			
Apr-03	NA	NA	NA	NA		0.684	· [< 0.500	{	[
Oct-03	NA	NA	NA	NA	[2.26	·	<0.500		{	
Apr-04	NA	NA	NA	NA	~- {	2.94		0.811		(·
Oct-04	NA	NA	NA	<0.80	<2.00	3.83	<1.00	<2.00			

5-Year Review Data Tables REV 4-6-05.xls

4/14/2005

Table ♠ *l*Total Petroleum Hydrocarbons Detected in Groundwater
Linnton Oil Fire Training Grounds
Portland, Oregon

	Verify.		Norti	nwest Test N	/lethods (NWTPH)					EPA Method
Well Number &	2 M H	CID (mg/	L) to the	Gx (mg/E)	CHARLE !	Dx	(mg/E) v		- ₁ 8015M	(mg/L).	418 1 (mg/ L)
Sample Date:			Heavy		#6 Fire			Heave Only			
SampleiDate	Cas	Diesel -	OU	Cas :	Oil	Decal.	Kerosene	Heavy Oil/ Motor Oil		Diesel	
	I CONTRACTOR OF STREET	110000000000000000000000000000000000000	STREET,	A STATE OF THE PARTY OF THE PAR	CONTRACTOR MANAGEMENT	TOWNS CHARGE STREET	(Automorane)	TO COMPANY AND THE SECOND	STATES CONTRACTOR	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Construction to the second control of
MW-10					Ì.	<u> </u>	ļ	1	-10	-25	774
Dec-93	NR	NR	 NR	<0.08		3.99		0.753	<1.0	<2.5	NA
Apr-01 Oct-01	NR	NR	NR	<0.08		2.97	1	0.733	1]]
Apr-02	NR	NR	NR NR	<0.08		1.46	}	0.661		· ·	}
Oct-02	NA NA	NA NA	NA NA	NA		0.827		< 0.500]	1
Apr-03	NA NA	NA NA	NA NA	NA NA		1.83		<0.500			
Oct-03	NA	NA NA	NA NA	NA NA		0.315		<0.500			1
Apr-04	NA	NA NA	NA	NA		0.461		<0.500			
Oct-04	NA	NA	NA	<0.80	<0.500	0.768	<0.250	<0.500			
MW-11											
Oct-04	NA	NA	NA	<0.80	<0.500	<0.250	<0.250	<0.500			
MW-12		14/1		10.00	10.000	10:200	1	10.500		 	
Oct-04	NA	NA	NA	<0.80	<0.500	<0.250	<0.250	<0.500			
	IVA	IVA	IVA	₹0.00	\0.300	1 40.250	1 (0.230	~0.300			
<u>MW-13</u>	-0.05	DET.	DET	0.20		0.75]	-0 F00		1	}
Nov-99	<0.25	DET DET	DET <0.63	0.38 NA		0.75 7.12		<0.500 <0.500			
Apr-00 Oct-00	<0.25	DET	DET	NA NA		11.8		1.38		l	
	<0.25 NR	NR NR	NR .	0.178		9.09		1.06			
Apr-01 Oct-01	NR	NR	NR	0.178		11.1		2.19]	
Apr-02	NR NR	NR	NR	0.312		8.37		1.69]	
Oct-02	NA NA	NA NA	NA	0.104		9.4]]	<0.500			
Apr-03	NA NA	NA	NA NA	0.283		6.46		<0.500]	
Oct-03	NA	NA NA	NA.	<0.08		6.78		<0.500	. .		
Oct-03 (DUP)	NA	NA	NA	<0.08		7.58		<0.500			
Apr-04	NA	NA	NA	0.332		4.95		0.91			
Apr-04 (DUP)	NA	NA	NA	0.383		3.61		0.548	- -		
Oct-04	NA	NA	NA	<0.80	<5.00	11.5	<2.50	<5.00			
MW-14		ĺ									
Nov-99	<0.25	<0.63	<0.63	<0.08		0.32		<0.500		1	
Nov-99 (Dup)	<0.25	<0.63	<0.63	<0.08		0.32		<0.500		·	
Apr-00	<0.25	<0.63	<0.63	NA		NA		NA			
Apr-00 (Dup)	<0.25	< 0.63	<0.63	NA		NA		NA			
Oct-00	<0.25	<0.63	<0.63	NA		NA		NA			
Apr-01	NR	NR	NR	0.0854		0.767		<0.500			
Apr-01 (Dup)	NR	NR	NR	<0.08		0.724		<0.500			
Oct-01	NR	NR	NR	<0.08		0.541		<0.500			- -
Apr-02	·NR	NR	NR	<0.08	}	<0.250		<0.500			-
Oct-02	NA	NA	NA	NA		0.474		<0.500			
Apr-03	NA	NA	NA	NA		<0.250		<0.500			
Oct-04	NA	NA	NA	NA		<0.250	- -	<0.500			
Apr-04	NA	NA	NA	NA		<0.250	}	<0.500	-÷ }		
Oct-04	NA	NA	NA_	<0.80	<0.500	0.669	<0.250	<0.500			

-5-Year Review Data Tables REV 4-6-05.xls 4/14/2005

Table # 1 Total Petroleum Hydrocarbons Detected in Groundwater Linnton Oil Fire Training Grounds Portland, Oregon

Dup Duplicate Sample mg/L

Milligrams per liter
Indicates less than the method reporting limit ć

NA Not analyzed

Requested on Chain of Custody - results not reported NR

Detected DET

Table ■ 2
Semivolatile Organic Compounds Detected in Groundwater
Linnton Oil Fire Training Grounds
Portland, Oregon

, 8		1			£ 40	ompound	concentra	tion in jug	ild gr			
									e de la composition della comp			enol
:WelliNumber	, Sample Date s	lie ii				e E	rene			nei/c		atorio Topin
					norme	2,300/620 b b b b b b b 6.2 b 180 b 0.0092 9	ysen	entachlore				
				in the			A L	A A		Bern		Pen
Cleanup(Criteria)	RBC	b	ь	b	ь	ь		b	0.028 ^c	0.02 ^c	0.032 °	b
	WQCS (acute/chronic)	1,700/520	Ъ	3,980/NV	ъ	2,300/620	Ъ	ъ	ъ	ъ	ъ	20/13
Screening Level : Values :	MCL	Ъ	_ b	b	b	b	ь	ь	b	0.2	b	1.00
	PRG	370	1800	1500	240	6.2	ь	180	b	0.0092	9.2	0.56
	Nov-99	<1.0	<1.0	<0.1	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1	NA
	Apr-00	<1.0	<1.0	<0.1	<0.1	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1	NA
	Oct-00	<0.2	<0.2	<0.2	0.23	<1.0	<0.2	<0.2	<0.2	<0.2	<0.2	<2.0
·	Oct-00(Dup)	<0.2	<0.2	<0.2	<1.0	<1.0	<0.2	<0.2	<0.2	<0.2	<0.2	<2.0
MW-1	Apr-01	d	d	d	d	d.	d	d	d	d	đ	<2.0 °
	Oct-01	d	đ	d	d	d	, d	d	d	d ·	d	<1.0
· .	Apr-02	đ	d	d	đ	d	d	d	d	d	d	<1.0
·	Oct-02	d	đ	d	d	d	d	d	d	d	d	d
	Oct-04	<0.10	<0.10	<0.10	<0.10	<0.10	0.150	<0.10	<0.10	<0.10	<0.10	<1.0

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Table ♣ ¬
Semivolatile Organic Compounds Detected in Groundwater
Linnton Oil Fire Training Grounds
Portland, Oregon

_					C	ompound	concentra	tioneinjug	ile en e		ret in	
WellkNumber	#Sample Drice	Acenaphtheme	Anthracence	illuoramineme 1	Huorene da esta	Vipluialene (4,7)	ilienendirene I	Dyreno	Beitzo(a)knüirekene.	Benzo(a)pyrene	Ghrysner:	Pentachloropheriol
Cleanup Criteria	RBC	b	ь	b	b	b	b	b	0.028 °	0.02 °	0.032 °	b
Screening Level	WQCS (acute/chronic)	1,700/520	·b	3,980/NV	b	2,300/620	Ъ	Ъ	ь	ь	ь	20/13
Values and	MCL	b	b	ь	b	Ъ	b	b	ь	0.2	ь	1.00
Values	PRG	370	1800	1500	240	6.2	b	180	b	0.0092	9.2	0.56
	. Jul-93	4.2	2.3	3.7	4.6	83.0	4.6	1.3	2003	0.2	2023	NA
]	Dec-93	5.1	3.4	11.0	8.1	13.0	7.1	2.7	108	200	20,63	NA
	Dec-93 (Dup)	8.4	2.0	6.1	11.0	21.0	6.2	2.5		0.5	07	NA
1	Nov-99	4.42	0.384	<2.0	3.42	17.80	1.81	<0.1	<0.1	<0.1	<0.1	NA
	Apr-00	3.21	0.376	<0.1	3.64	42.40	1.96	<0.1	<0.1	<0.1	<0.1	NA
	Oct-00	6.35	0.846	0.514	7.00	12.0	4.79	<0.5	<0.5	<0.5	<0.5	<5.0
MW-2	Apr-01	5.47	0.908	0.503	5.76	41.10	2.84	0.50	0.150	<0.1	0 162	<1.0
	Oct-01	3.81	1.170	0.772	3.81	<1.5	3.31	0.754	0.203	<0.1	00215	<1.0
	Apr-02	1.29	0.447	0.296	2.59	9.39	0.869	0.261	<0.1	<0.1	<0.1	<1.0
	Oct-02	3.73	0.719	0.542	4.26	5.65	2.450	0.568	0.160	<0.1	×10.147a	<1.0
	Apr-03	1.71	0.313	0.131	3.21	6.02	1.45	0.181	<0.1	<0.1	<0.1	d
	Apr-03 (Dup)	1.70	0.344	<0.100	3.28	4.72	1.99	0.151	<0.1	<0.1	<0.1	d
	. Oct-03	5.14	0.738	0.448	5.65	3.92	3.34	0.397	<0.2	<0.2	<0.2	d
	Apr-04	1.70	0.426	0.227	3.44	8.41	1.90	0.189	<0.1	<0.1	<0.1	d
<u> </u>	Oct-04	3.96	0.597	0.296	5.18	0.591	2.37	0.201	<0.10	<0.10	<0.10	<1.0
MW-4	Oct-04	<0.10	<0.10	<0.10	<0.10	<0.10	0.132	<0.10	<0.10	<0.10	<0.10	<1.0

5-Year Review Data Tables REV 4-13-05.xls 4/14/7

Table 2
Semivolatile Organic Compounds Detected in Groundwater
Linnton Oil Fire Training Grounds
Portland, Oregon

1 ordana, Oregon	1		4. Kr. 15. 63		o de la como	V. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.		Sales Constitution				
F					*** *********************************	ompound	lconcentra	tionvin µg				
									kienel A			ienol
WelliNumper	Sample Date	Acenaphthen	Amhircene	Autorninens S	Thorace in	Vapliithalene	្រំ ១មេសារ្យាធ្វើជាការគ្រ ម	Pyrende	Benzo(k)anim	Benzo(a)pyre	(anskrine)	Pentachlorop
Gleanup Critéria	RBC	b	Ъ	ъ	Ъ	Ъ	Ъ	ъ	0.028 ^c	0.02 °	0.032 °	b
Screenings	WQCS (acute/chronic)	1,700/520	b	3,980/NV	b	2,300/620	b	b	b	b	ь	20/13
Screening/Level	MCL	Ъ	b	b	Ъ	ь	b	b	Ъ	0.2	ь	1.00
	PRG	370	1800	1500	240	6.2	b	180	b	0.0092	9.2	0.56
	Nov-99	<0.1	0.257	<0.1	<0.1	<0.5	<0.1	0.147	<0.1	<0.1	<0.1	NA
	Apr-00	<0.5	0.365	0.3	1.1	<1.0	<0.1	0.222	<0.1	<0.1	<0.1	NA
[Oct-00	<0.1	<2.0	0.16	<2.0	<2.0	<2.0	0.284	<0.1	<0.1	<0.1	625
Į Į	Apr-01	d	<u>d</u>	d	· d	d	d	đ	d	d	d	1.85 °
	Oct-01	d	d	d	đ	đ	d	d	d	d	d	24176
MW-5	Apr-02	d	d	đ	đ	đ	d	d	d	d	d	<1.0
	Oct-02	d	d	d	d	d	đ	d	d	d	d	9.18
	Apr-03	d	d	d .	d	d	d	· d	d	ď	d	<2.0
	Oct-03	d	d	d	đ	d	d	d	d	d	d	5.64
	Apr-04	d	d	d	d	d	d	d	d	d	d	<1.0
	Oct-04	<0.10	0.123	<0.10	<0.10	<0.10	0.150	0.166	<0.10	<0.10	<0.10	4.91
	Oct-04 (Dup)	<0.10	0.114	<0.10	<0.10	<0.10	0.130	0.179	<0.10	<0.10	<0.10	3.83
	Apr-02	NA	NA	NA	. NA	NA	NA	NA	NA	NA	NA	<1.0
MW-7 ^g	Oct-02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA ,	<1.0
11114-1	Apr-03	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	d
L	Oct-04	<0.10	<0.10	<0.10	<0.10	<0.10	0.118	<0.10	<0.10	<0.10	<0.10	<1.0

Table § 2
Semivolatile Organic Compounds Detected in Groundwater
Linnton Oil Fire Training Grounds
Portland, Oregon

					0.00	ompound	doncentra	tion in Tre				
Well-Number-	SampleDate	eu	validacene National	trozmirana		knuitelere	ileingrifficerie	Naile I	Seizo(a)antireicene	enzolajpyrene	Inysene?	entachlorophenol
CleanupiCriteria	RBC	b	b	b	b	b b	b	b	0.028 °	0.02 °	0.032 °	b
	WQCS (acute/chronic)	1,700/520	ъ	3,980/NV	b	2,300/620	b	b	b	ъ	ь	20/13
L Screening Level	MCL	ь	ь	b	b	b	ь	b	b	0.2	b	1.00
Screening/Level	PRG	370	1800	1500	240	6.2	b	180	ъ	0.0092	9.2	0.56
	Apr-02	NA	NA	NA	NA	NA	NA	, NA	NA	NA	NA	<1.0
	Oct-02	NA	NA	NA	NA	NA ·	NA	NA	NA ·	NA	NA	<1.0
MW-8 ^g	Apr-03	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	d
	Oct-04	0.550	<0.10	<0.10	0.544	<0.10	<0.10	<0.10	<0.10	S	<0.10	<1.0
	Nov-99	<1.0	<1.0	<0.1	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
) .	Apr-00	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
	Oct-00	<0.2	<0.2	<0.2	<0.2	<1.0	<0.2	<0.2	<0.2	<0.2	<0.2	8.93
	Apr-01	d	d	ď	d	d	d	d	d	d	d	7.11 °
.	Oct-01	d	d	d	d	ď.	d	d	d	d	d	2.12
MW-9	Apr-02	d	d	d	d.	d	d	d	d	d	d	<2.0
	Oct-02	d	d	d	d_	d	d	d	d	d	d	2,35
Į.	Apr-03	d	d	d	d	d	d	d	d	d	d	7.05
	Oct-03	d	d _.	d	d	đ	d	d		 		<1.0
	Apr-04	d	d	d	d	d	d	d				<1.0
L	Oct-04	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<1.0

Year Review Data Tables REV 4-13-05,xls

Table # 2
Semivolatile Organic Compounds Detected in Groundwater
Linnton Oil Fire Training Grounds
Portland, Oregon

					C	om:ound	concentie	(ion;in;µg				
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n - 12 - 12 - 12 - 12 - 12 - 12 - 12 - 1									4 . 5	. 0		o O
WellNumber	Sample Date	eue				a a	e G			i i		di
		hith The	8		- 20	, lui			9)	i i	ne	HIOT
		Tarasty		e co	. 6			100		020		9
		7 3 V	e da la co	E	ania Min	Z		Û	B	B	- d	Be
Cleanup Criteria	RBC	b	ь	b	ь	ь	ь	b	0.028 ^c	0.02 °	0.032 °	, b
Screening) Level	WQCS (acute/chronic)	1,700/520	ь	3,980/NV	ь	2,300/620	b	b	ь	b	ъ	20/13
Values 3	MCL	b	b	· в	ь	ь	b	b	b	. 0.2	. b	1.00
	PRG	370	1800	1500	240	6.2	b	180	b	0.0092	9.2	0.56
	Dec-93	<0.5	<0.05	<0.1	<0.1	<0.5	<0.05	<0.1	<0.1	0.1	>0.1	NA
	Apr-01	<0.5	<0.5	<0.5	<0.5	<0.5	. <0.5	<0.5	<0.5	<0.5	<0.5	21(40)
·	Oct-01	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	11.80
. [Apr-02	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	7.80
MW-10 ^f	Oct-02	d	d	d	d	d	đ	d	d	d	d	7.58
	Apr-03	đ	d	đ	đ	d	đ	d	d	d	d	2.57
	Oct-03	đ	đ	d	đ	đ	d	d	d	d	d	3.41
<u> </u>	Apr-04	d	d	d	d	d	d	d	d	d	d	9.86
	Oct-04	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	3.19
MW-11	Oct-04	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<1.0
MW-12	Oct-04	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<1.0

5-Year Review Data Tables REV 4:13-05.xds 4/14/2005

Table 2 2
Semivolatile Organic Compounds Detected in Groundwater
Linnton Oil Fire Training Grounds
Portland, Oregon

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						7						
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3 Well Number 5	Sample Date	ene S		. g						i i		- 6
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									S S	OZ.	2.5	tack.
		7.7			。唐·		Table		5.5		-	Pentachilor
Cleanup Griterias	RBC	b	Ь	ь	b	b	Ъ	Ъ	0.028 ^c	0.02 ^c	0.032 °	b
ScreeningsLevel	WQCS (acute/chronic)	1,700/520	b	3,980/NV	b	2,300/620	b	b	b	b	b	20/13
Value	MCL	ь	b	b	ь	ь	b .	ъ	ь	0.2	b	1.00
Values (*)	PRG	370	1800	1500	240	6.2	b	180	b	0.0092	9.2	0.56
	Nov-99	5.3	<1.0	<1.0	7.25	<5.0	5.56	<1.0	<1.0	<1.0	<1.0	NA
·	Apr-00	<1.0	<1.0	<1.0	1.86	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NA
·	Oct-00	<1.0	<5.0	<1.0	3.68	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	45145
	Apr-01	d	d	đ	ď	ď	đ	d	d	d	d	198
	Oct-01	d	d	đ	ď	d	d	d	d	d	d	
	Apr-02	d	d	đ	d	d	d	d.	d	d	d	<1.0
MW-13	Oct-02	d	d	d	đ	d	d	d	d	đ	. d	7.44
\	Apr-03	d	d	d	d	d	d	. d	· d	ď.	d	<4.00
	Oct-03	d ·	d	d	d	d	d	d	d	d	d	20 40 4
	Oct-03 (Dup)	d	đ	d	d	d	d	d	d	, d	ď	3770
	Apr-04	d	d	d	d	d	d	d	d	d	d	<1.0
·	Apr-04 (Dup)	d	d	d	d	d	d	d	d	d	d	<1.0
	Oct-04	0.158	0.639	0.128	2.43	<0.10	0.143	0.102	<0.10	<0.10	<0.10	12.8

(ear Review Data Tables REV 4-13-05 vis

Table \$ 2
Semivolatile Organic Compounds Detected in Groundwater
Linnton Oil Fire Training Grounds
Portland, Oregon

Tordana, Oregon	Γ	Profession of Cody Co	2-02-450-110-00-00-0	de relation of the same and	The state of the s		Salar market salar mi	Annalus (C. 21 Seven	statement of the service	or new state of the second	aran sahara manyara sah	Test and Victorian
					east rise	ompound:	congentra	tion in µg	Lagran			
									racene	91.		henoli
Well, Number	Sample Date	ueupįdaies;	Authersite	ចាធ់ប្រើកេសបារ	eueronji.	Neighturitene	्राम्यसम्बद्धाः जन्मसम्बद्धाः	a biiaxa	Berzo(a)anth	Benzo(a) pyre	(Physene	Pentachlorophen
Cleanup/Criteria 2	RBC	ь	b	b	b	ь	ъ	ь	0.028 °	0.02 ^c	0.032 °	b
Screening Level	WQCS (acute/chronic)	1,700/520	· b	3,980/NV	b	2,300/620	b	Ъ	b	· b	Ъ	20/13
Valued	MCL	b	b	ь	ь	b	Ъ	b	b	0.2	b	1.00
	PRG .	370	1800	1500	240 .	6.2	ь	. 180		0.56		
1	Nov-99	<0.1	<0.1	<0.1	<0.1	0.172	<0.1	<0.1	<0.1	<0.1	<0.1	NA
	Nov-99 (Dup)	<0.1	<0.1	<0.1	<0.1	0.22	<0.1	<0.1	<0.1	<0.1	c 0.032 c b b c c 0.01 c c c c c c c c c c c c c c c c c c c	NA
{	, Apr-00	<0.1	<0.1	<0.1	0.148	0.793	0.151	<0.1	<0.1	<0.1	<0.1	NA.
\ <u>\</u>	Apr-00 (Dup)	<0.1	<0.1	<0.1	0.150	0.694	0.157	<0.1	<0.1	<0.1	<0.1	NA
	Oct-00	<0.1	<0.1	<0.1	<0.1	0.181	<0.1	<0.1	<0.1	<0.1	<0.1	3.62
	Apr-01	d	d	d	d	d	d	đ	d	d	d	4.30 e
MW-14	Apr-01 (Dup)	đ	d	<u>.</u> d	d	d	đ	d	d	d	b 9.2 <0.1 <0.1 <0.1 <0.1 <0.1 d d d d d d d d d d d d d	4.24 e
	Oct-01	d	đ	đ	d	d	d	d	d	d	d	2.12
1	Apr-02	d	đ	d	d	d	đ	đ	d	d	d	2.48
	Oct-02	d	d	. d	d	d	d	d	d	d	d	1.71
	Apr-03	d	d	d	d .	· d	d	d	d	d	d	1.09
	Oct-03	d	d	d	d	d	d	d	d	d	d	<1.00
1 ·	Apr-04	d	đ	d	d	d	d	d	d	d	d	2.02
	Oct-04	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	1.73

Table **\$**2

Semivolatile Organic Compounds; Polynuclear Aromatic Hydrocarbons Detected in Groundwater

Linnton Oil Fire Training Grounds

Portland, Oregon

Notes:

- 1. Samples analyzed by EPA Test Method 8270 SIM unless otherwise noted
- 2. Only PAH compounds detected above method reporting limits are shown on Table 4
- 3. Shaded values designate concentrations that exceed RBC cleanup criteria or WQCS screening values
- a) Compound evaluated in AGI's RI/FS Endangerment Assessment
- b) Cleanup criteria and/or screening level values not listed in documents cited
- c) Cleanup criteria is less than the method reporting limit of 0.10 μg/L
- d) Removed from the sampling schedule COC concentrations < method reporting limits for two consecutive sampling events
- e) Analyzed by EPA Method 8040 MOD
- f) MW-10 replaced MW-4 as a compliance monitoring well starting with the April 2001 sampling event
- g) MW-7 and MW-8 added to the compliance well network starting with the April 2002 sampling event analyzed for PCP only
- Indicates less than the method reporting limit
- NA Not analyzed
- Dup Duplicate Sample
- μg/L Micrograms per liter
- RBC Risk-based Concentrations From AGI's RI/FS Endangerment Assessment Primary Cleanup Goal
- WQCS Water Quality Criteria Summary: Oregon acute and chronic freshwater aquatic life criteria OAR 34-41 Table 20 and updated Tables 33A & C
- MCL EPA National Primary Drinking Water Regulations Maximum Contaminant Level (MCL)
- PRG EPA Region 9 Preliminary Remediation Goals for tap water (generic screening tables October 2004)
- NV No screening value listed

Table § 3
Volatile Organic Compounds Detected in Groundwater
Linnton Oil Fire Training Grounds
Portland, Oregon

		Min.		¥ 20					t C	ompõu	nd (co	ncentr	ations	inthe/	9)	es and						2004
		(J)				iĝ.			e E												Θ.	
Well	Sample	than		e de			The second				g						e E	i ė.			Ē	-
Number	T. Dale		1	oeth					Ö	e e			ر 10°	Ę				22.		8	le i	2
		Į.	101	oj:				if i	6				, i	19		e e				yler	o Local	Ψ.
			Teatr	1016		ella.				\$	9	8			n Propo	E .	e de	a a				
											SS .	TIME	123			Ĝ		8	2	101		
Cleanup Criteria	RBC	ь	ъ	0.39°	ъ	b	ъ	8.2	b	b	b	b	ъ	b	ъ	ъ	ъ.	ъ	ь	Ъ	ъ	0.13°
Screening Level	WQCS acute/chronic	18,000 /NV	b	ь	b	118,000 /20,000	ь	5,300 /NV	b	32,000 /NV	b	ь	2300 / 620	ь	ъ	b	ь	ь	17,500 /NV	b	45,000 /21,900	b ·
Valueses	MCL	200	ь	7.0	b	5.0	Ь.	5.0	<i>7</i> 0	700	ь	b	ь	b	ь	ь	b	ь	1000	10,000	5.0	2.0
	PRG	3200	810	340	12	0.12 °	12	b	61	1300	b	b	ь	240	240	b	ь	240	720	210	0.28	0.20
	Nov-99	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		<1.0	<1.0
[Арг-00	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	4.52	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1	<1.0	<1.0
MW-1	Oct-00	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.85	<1.0	<1.0	<2.0	<2.0	<2.0	<5.0	<1.0	<1.0	<2.0	<1.0	<1.0		<1.0	<1.0
	Oct-00 (Dup)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.74	<1.0	<1.0	<2.0	<2.0	<2.0	<5.0	<1.0	<1.0	<2.0	<1.0	<1.0	_	<1.0	<1.0
]	Apr-01	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d
	Oct-04	<2.00	<1.00	<2.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00

Table • 3
Volatile Organic Compounds Detected in Groundwater
Linnton Oil Fire Training Grounds
Portland, Oregon

			N.C.A	ar es		a Lynn	10 4 3		e e C	mpou	nd/(co	ncentr	ations	invug/l	() () ()	(#257Z)		M v av	A W			
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Number	Dife			on the		12					0		781	a	6 57		e e	45			e.	4
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				- 5		Ě		E.				E.	Œ		R.		X E		123	· 5		E.
	2.0	ा के जिल्लान स	oppua-tra			is solution of the contract	1,655.41.mmc [157]]				0.50		je.		0 11 1	li∕S∈o	9	9			1	S E
						州 泰园 300			i													
Cleanup Criterias	RBC WQCS	ь 18,000	ь	0.39°	b	ь 118,000	ь	8.2 5,300	b	ъ 32,000	ь	b	ь 2300	b .	ь	b	b	ь	ь 17,500	ь	ь 45,000	0.13°
Screening Level	acute/chronic	/NV	ь	b	b	/20,000	Ъ.	/NV	ъ	/NV	Ъ	b	/ 620	ь	Ъ	b	b	Ъ	/NV	b	/21,900	b
eValues	MCL	200	ъ	7.0	b	5.0	Ъ.	5.0	70	700	b	ь	b	b	ь	b	b	b	1000	10,000	5.0	2.0
Values 2	PRG	3200	810	340	12 .	0.12 °	12	b	61	1300	b	b	b	240	240	b	b	240	720	210	0.28	0.20
	Jul-93	<0.5	<0.2	<0.2	g	<0.2	g	1000	0.5	0.5	g	-	-	g	g	-	g	g	24	1100	<0.2	<1.0
	Dec-93	<0.5	<0.2	<0.2	g	<0.2	g	5 .3 ·	<0.2	14	g		1	g	g	-	g	g	1.2	25	<0.2	<1.0
1	Dec-93 (Dup)	<0.5	<0.2	<0.2	g	<0.2	g	5.2	<0.2	14	g	-	-	g	g	-	g	g	1.4	24	<0.2	<1.0
}	Nov-99	<1.0·	<1.0	<1.0	110	<1.0	30.6	931	<1.0	18.1	51.1	71.9	20.9	9.5	104	<1.0	1.51	9.41	1.15	-	<1.0	<1.0
	Apr-00	<1.0	<1.0	<1.0	267	<1.0	59.7	452	<1.0	119	61.0	393	34.7	14.3	145	15.3	1.16	11.8	7.28		<1.0	<1.0
1	Oct-00	<1.0	<1.0	<1.0	41.1	<1.0	18.8	6.49	<1.0	5.51	42.6	6.96	6.05	12.3	93.1	<1.0	<2.0	8.86	<1.0	-	<1.0	<1.0
	Apr-01	<1.0	<1.0	<1.0	149	<1.0	32	293	<1.0	102	50.8	208	74.9	17.3	126	7.51	<2.0	9.46	4.3	-	<1.0	<1.0
MW-2	Oct-01	<1.0	<1.0	<1.0	4.02	<1.0	3.99	5.02 51.0	<1.0	<1.0	34.2	<2.0	<2.0	9.97	73.1	<1.0	<2.0	8.78	<1.0		<1.0	<1.0
	Apr-02 Oct-02	<1.0 <1.0	<1.0	<1.0 <1.0	40.2 32.9	<1.0 <1.0	11.50	264	<1.0 1.11	53.4 7.86	25.0 42.5	81.3 8.91	24.4 4.67	7.43	52.8 92.3	6.25 <1.0	<2.0 <2.0	7.99	5.08 <1.0		<1.0 <1.0	<1.0
1	Apr-03	<1.0	<1.0	<1.0	13.2	<1.0	3.6	57/4	<1.11	19.8	29.0	11.3	10.1	8.86	59.5	<1.0	<2.0	8.40	2.45		<1.0	<1.0
	Apr-03 (Dup)	<1.0	<1.0	<1.0	12.7	<1.0	3.48	56.8	<1.0	19.5	27.1	11.5	10.1	8.51	55.1	<1.0	<2.0	7.64	2.88		<1.0	<1.0
) ·	Oct-03	<1.0	<1.0	<1.0	2.17	<1.0	3.35	336	1.15	2.68	53.9	9.0	<2.00	12.40	117	1.38	<2.0	12.20	1.83	 	<1.0	<1.0
	Apr-04	<2.0	<2.0	<2.0	6.24	<2.0	3.58	67/8	<2.0	42	53.6	23.8	20.0	13.6	118	3.08	<4.0	9.82	5.42	-	<2.0	<2.0
	Oct-04	<2.00	<1.00	<2.00	<1.00	<1.00	2.0	235	2.3	3.1	49.2	<2.00	1.1	<1.00	73.6	<1.00	<1.00	10.0	1.1	<2.00	<1.00	<1.00

5-Year Review Data Tables REV 4-13-05.xls

Table €3
Volatile Organic Compounds Detected in Groundwater
Linnton Oil Fire Training Grounds
Portland, Oregon

					ji de	(C-7)			***C	impoù	nd (co	ncentr	ations	inqμg/)							
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Well	-Sample	TE .	e e	ene ene	5	Ē	5				2				10 E							
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1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1						2	9	Be	-60		S.		e Zi			8	7	3	01	0	ME.	
Cleanup Critéria	RBC	b	b	0.39°	b	b	b	8.2	ь	b	b	ь	ь	ь	ъ	Ъ	ь	ъ	b	Ъ	ь	0.13°
	WQCS acute/chronic	18,000 /NV	ь	b	ь	118,000 /20,000	ь	5,300 /NV	b	32,000 /NV	ь	ь	2300 / 620	ь	ь	ь	ь	b	17,500 /NV	b	45,000 /21,900	ъ
Screening Level	MCL	200	ь	7.0	ь	5.0	b	5.0	<i>7</i> 0	700	b	ъ ;	Ъ	ь	ь	ь	b	b .	1000	10,000	. 5.0	2.0
	PRG	3200	810	340	12	0.12 °	12	ь	61	1300	b	ь	Ъ	240	240	b	b	240	720	210	0.28	0.20
MW-4	Oct-04	<2.00	<1.00	<2.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<1:00	<1.00
	Nov-99	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.00	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		<1.0	13.2
	Apr-00	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	1.56	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		<1.0	71/43
	Oct-00	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.5	<1.0	<2.0	<2.0	<2.0	<5.0	<1.0	<1.0	<2.0	<1.0	<1.0	<u> </u>	<1.0	28.13
	Apr-01	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	3.26	<5.0	<1.0	. <1.0	<2.0	<1.0	<1.0	-	<1.0	<1.0
	Oct-01	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<5.0	<1.0	<1.0	<2.0	<1.0	<1.0	<u> - </u>	<1.0	\$3.00¢
\\ . \\	Apr-02	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<5.0	<1.0	<1.0	<2.0	<1.0	<1.0		<1.0	334
MW-5	Oct-02	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.58	<1.0	<2.0	<2.0	<2.0	<5.0	1.23	<1.0	<2.0	<1.0	<1.0	<u> </u>	<1.0	128
]]	Oct-02 (Dup)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.62	<1.0	<2.0	<2.0	<2.0	<5.0	<1.0	<1.0	<2.0	<1.0	<1.0	<u> </u>	<1.0	1194
	Apr-03	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<5.0	<1.0	<1.0	<2.0	<1.0	<1.0		<1.0	1.81
	Oct-03	<1.0	<1.0	<1.0	1.56	<1.0	<1.0	<1.0	1.23	<1.0	<2.0	<2.0	<2.0	<5.0	<1.0	<1.0	<2.0	<1.0	<1.0	<u>-</u>	<1.0	9.18
	Apr-04	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<5.0	1.49	<1.0	<2.0	<1.0	<1.0		<1.0	243
. }	Oct-04	<2.00	<1.00	<2.00	<1.00	<1.00	<1.00	<1.00	2.6	<1.00	<1.00	<2.00	<1.00	<1.00	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<2.00 <2.00	<1.00	3.3 ×
MW-7	Oct-04 (Dup) Oct-04	<2.00 <2.00	<1.00 <1.00	<2.00 <2.00	<1.00 <1.00	<1.00	<1.00 <1.00	<1.00 <1.00	2.7 <1.00	<1.00 <1.00	<1.00 <1.00	<2.00 <2.00	<1.00 <1.00	<1.00 <1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00
1727 7-7	OCI-04	~2.00	~1.00	~2.00	~1.00	×1.00	~1.00	<u> </u>	<u> </u>	L >1.00	~1.00	~2.00	\1.00	<u> </u>	1.00	1.00	1.00	1.00	1.00	1 72.00		1 -1.00

5-Year Review Data Tables REV 4-13-05.xls

Table • 3
Volatile Organic Compounds Detected in Groundwater
Linnton Oil Fire Training Grounds
Portland, Oregon

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							ā	iste ka h nan		off-signal		lodos					1 de 1		. 0	<u></u>	To	D.	
C	leanup: Criteria	RBC	b	b	0.39°	b	b	b	8.2	b	b	b	b	b b	b.	b	b	b	b	b	b b	b	0.13°
		WQCS	18,000	ъ	ь	-	118,000	b	5,300	ь	32,000	b	ь	2300	ь	ь	b	ь		17,500	<u>ь</u>	45,000	ь
S	eening Levely	acute/chronic MCL	/NV 200	b	7.0	ь	/20 <u>,000</u> 5.0	ь	/NV 5.0	70	/NV 700	ь	b	/ 620 Ъ	ь	b	ь	ъ	ь	/NV 1000	10,000	/21,900 5.0	2.0
	Values	PRG	3200	810	340	12	0.12 °	12	5.0 b	61	1300	ь	ь	ь	240	240	ь	ь	240	720	210	0.28	0.20
	MW-8	Oct-04	<2.00	<1.00	<2.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00			<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00
╠	17177-0	Nov-99	<1.0	<1.00	<1.0	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00 <2.0	<1.00 <1.0	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	~2.00	<1.00	<1.00
		Apr-00	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		<1.0	<1.0
#	MW-9	Oct-00	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.05	<1.0	<2.0	<2.0	<2.0	<5.0	<1.0	<1.0	<2.0	<1.0	<1.0		<1.0	<1.0
∥		Apr-01	d	d	d	d	d	d	ď	d	d	d	d	d	ď	d	d	d	d	d		d	d
-		Oct-04	<2.00	<1.00	<2.00	<1.00	<1.00	<1.00	<1.00	2.2	<1.00	<1.00	<2.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00
		Dec-93	<0.5	<0.2	<0.2	g	<0.2	g	<0.5	<0.2	<0.5	g	-	-	g	g	<u>-</u> ·	g	g	<0.5	<0.5	<0.2	<1.0
		Apr-01	<1.0	<1.0	<1.0	<1.0	1.11	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<5.0	<1.0	<1.0	<2.0	<1.0	<1.0	-	<1.0	<1.0
	MW-10 ^f	Oct-01	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<5.0	<1.0	<1.0	<2.0	<1.0	<1.0	-	<1.0	<1.0
	1414 4-10	Apr-02	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<5.0	<1.0	<1.0	<2.0	<1.0	<1.0	-	<1.0	<1.0
		Oct-02	d	· d	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d		d	d
	 	Oct-04	<2.00	<1.00	<2.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00
L	MW-11	Oct-04	<2.00	<1.00	<2.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00
L	MW-12	Oct-04	<2.00	<1.00	<2.00	<1.00	<1.00	′ <1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00

5-Year Review Data Tables REV 4-13-05.xls 4/14/2005

Table § 3

Volatile Organic Compounds Detected in Groundwater
Linnton Oil Fire Training Grounds
Portland, Oregon

Wells Samp Number Date Cleanup Criteria RBC Screening Level WQC acute/chr Values PRG Nov-9 Apr-0	CS 18,000 hronic /NV CL 200	b b b	0.39° b 7.0 340	b b	b 118,000 /20,000 5.0	q q d 355-Trimethylberzene	8.2 5,300 /NV 5.0	b b	b 32,000 /NV 700	p Sopropy Denzence	b b	ouplethyde 2 b 2300 / 620	q m-But/lbenzene	d d n.Propylbenzene er ar	b	d d [P-Isopropy] Olumba	q o sec. Butylbenzene	b 17,500 / NV	σ σ Tolal Xylenes	(GS)L) JUJU JACON JUJU JACON J	0.13°
Number Date Date	CS 18,000 hronic /NV CL 200	b b b	0.39° ь 7.0	b b	118,000 /20,000	b	8.2 5,300 /NV	о о (cis:12/Diction	b 32,000 /NV	ь	ь	ъ 2300	b	b	b	b	-	ь 17,500	b	, b 45,000	
Number Date Date	CS 18,000 hronic /NV CL 200	b b b	0.39° ь 7.0	b b	118,000 /20,000	b	8.2 5,300 /NV	о о (cis:12/Diction	b 32,000 /NV	ь	ь	ъ 2300	b	b	b	b	-	ь 17,500	b	, b 45,000	
Number Date Date	CS 18,000 hronic /NV CL 200	b b b	0.39° ь 7.0	b b	118,000 /20,000	b	8.2 5,300 /NV	о о (cis:12/Diction	b 32,000 /NV	ь	ь	ъ 2300	b	b	b	b	-	ь 17,500	b	, b 45,000	
Screening Level acute/chr Values MCL PRG Nov-9	CS 18,000 hronic /NV CL 200	b b b	0.39° ь 7.0	b b	118,000 /20,000	b	8.2 5,300 /NV	b b	b 32,000 /NV	ь	ь	ъ 2300	b	b	b	b	-	ь 17,500	b	, b 45,000	
Screening Level acute/chr Values MCL PRG Nov-9	CS 18,000 hronic /NV CL 200	b b b	0.39° ь 7.0	b b	118,000 /20,000	b	8.2 5,300 /NV	b b	b 32,000 /NV	ь	ь	ъ 2300	b	b	b	b	-	ь 17,500	b	, b 45,000	
Screening Level acute/chr Values MCL PRG Nov-9	CS 18,000 hronic /NV CL 200	b b b	0.39° ь 7.0	b b	118,000 /20,000	b	8.2 5,300 /NV	b b	b 32,000 /NV	ь	ь	ъ 2300	b	b	b	b	-	ь 17,500	b	, b 45,000	
Screening Level acute/chr Values MCL PRG Nov-9	CS 18,000 hronic /NV CL 200	b b b	0.39° ь 7.0	b b	118,000 /20,000	b	8.2 5,300 /NV	b b	b 32,000 /NV	ь	ь	ъ 2300	b	b	b	b	-	ь 17,500	b	, b 45,000	
Screening Level acute/chr Values MCL PRG Nov-9	hronic /NV CL 200	b	ь 7.0	b	/20,000	 	/NV		/NV	ь	ь		Ъ	ь	Ъ	ь	Ъ		ъ.		ь
Nov-9	CL 200	╅	╁╼╾╅			b		70			ـــــ	/ 0ZU I					١.			1/// 71	, ~ թ
Nov-9		810	╁╼╾╅						/ / / /	ь	ь	ь	ь	ь	ь	b	ъ	1000	10,000	5.0	2.0
Nov-9	====		J4U I	12	0.12°	12	Ъ	61	1300	b	ь	ъ	240	240	ь	b	240	720	210	0.28	0.20
Apr-0	-99 <1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3.17	4.32	2.69	1.74	<2.0	1.06	1.46	3.76	2.68	<1.0	1.17	<1.0	-	<1.0	\$ 8.08°
	-00 <1.0	1.28	<1.0	1.49	1.30	<1.0	7.79 h	14.4	1.32	<1.0	<2.0	<1.0	<1.0	<1.0	4.68	<1.0	<1.0	<1.0		3.16	33351
Oct-0	-00 <1.0	1.04	<1.0	<1.0	1.25	<1.0	6.01 h	15.1	<1.0	<2.0	<2.0	<2.0	<5.0	<1.0	2.13	<2.0	<1.0	<1.0	-	3.48	242
Apr-0		<1.0	<1.0	<1.0	<1.0	<1.0	5.24 h	12.5	<1.0	<2.0	<2.0	<2.0	<5.0	<1.0	1.02	<2.0	<1.0	<1.0		3.14	217
Oct-0		<1.0	<1.0	<1.0	<1.0	<1.0	5.08 h	12.7	<1.0	<2.0	<2.0	<2.0	<5.0	<1.0	<1.0	<2.0	<1.0	<1.0	-	3.65	212
Apr-0		<1.0	<1.0	<1.0	<1.0	<1.0	3.33	2.12	1.36	<2.0	<2.0	<2.0	<5.0	3.13	1.32	<2.0	<1.0	<1.0		<1.0	<1.0
MW-13 Oct-0		<1.0	<1.0	<1.0	<1.0	<1.0	3.28	4.63	<1.0	<2.0	<2.0	<2.0	<5.0	<1.0	<1.0	<2.0	<1.0	<1.0		1.1	939
Apr-0		<1.0	<1.0	<1.0	<1.0	<1.0	2.19	1.56	<1.0	<2.0	<2.0	<2.0	<5.0	2.01	<1.0	<2.0	<1.0	<1.0	<u> </u>		2539
Oct-0		<1.0	<1.0	<1.0	<1.0	<1.0	3.1	7.3	<1.0	<2.0	<2.0	<2.0	<5.0	<1.0	<1.0	<2.0	1.86	<1.0	<u>- '</u>	2.74	037
Oct-03 (I		<1.0	<1.0	<1.0	<1.0	<1.0	2.74	6.4	<1.0	<2.0	<2.0	<2.0	<5.0 <5.0	<1.0 2.72	<1.0 <1.0	<2.0 <2.0	1.81 <1.0	<1.0	<u>-</u>	2.38	\$1218. <1.0
Apr-04 (1		<1.0 <1.0	<1.0	<1.0	<1.0	<1.0	1.79	<1.0 <1.0	<1.0 <1.0	<2.0 <2.0	<2.0 <2.0	<2.0 <2.0	<5.0 <5.0	2.72	<1.0	<2.0	<1.0	<1.0		<1.0	<1.0
Oct-0		+	<2.00	<1.00	<1.00	<1.00	2.4	5.0	<1.00	<1.00	<2.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	2.5	306

Table § 3
Volatile Organic Compounds Detected in Groundwater
Linnton Oil Fire Training Grounds
Portland, Oregon

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Well	Sample		ê				È.				Ċ						e e	10.0			Σ	
Number	Diffe.	0	4						<u>0</u>	é					E S			100			eue	. 8
		9	<u>0</u>	e co	e e	0	B		Ę		110	4	Ē	i i						15		
			4	126		ē	E	Elization (2	- 2	â	3			à	15			ene	Š.	ě	
		Ξě	J. Epichio	Ξ	16	8	1355-Trimethy	i i			±8 +		# S.	m Burylis	į.	iəli X ko	3	Ţ.	10	Total	Tricki	Viny
Cleanup Criteria	RBC	р эт арызгазы	b	0.39°	b	b	b	8.2	b	b	b	b	b	b	b	b	b	b	b	b b	b	0.13°
	WQCS	18,000	b	ь	ь	118,000	b	5,300	<u></u>	32,000	ь	ь	2300	. в	b	ь	ь	Ъ	17,500	ь	45,000	ъ
Screening Level	acute/chronic MCL	/NV - 200	b	7.0	b	/20,000 5.0	b	/NV 5.0	70	/NV 700	<u>ь</u>	ь	<u>/ 620</u> Ъ	ь	ъ	b	ь	b	/NV 1000	10,000	/21,900 5.0	2.0
Values	PRG	3200	810	340	12	0.12°	12	ь	61	1300	ь	ь	ъ	240	240	<u></u>	b	240	720	210	0.28	0.20
	Nov-99	141		1491	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		<1.0	<1.0
1	Nov-99 (Dup)	145		157	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		<1.0	<1.0
	Apr-00	125	3.01	109	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	<1.0	<1.0
	Apr-00 (Dup)	131	3.1		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	<1.0	<1.0
	Oct-00	21.4	4.24	2 02	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<5.0	<1.0	<1.0	<2.0	<1.0	<1.0	-	<1.0	<1.0
	Apr-01	105	10.8	107	<1.0	7.67	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<5.0	<1.0	<1.0	<2.0	<1.0	<1.0	-	<1.0	<1.0
MW-14	Apr-01 (Dup)	105	10.9	10/2	<1.0	7.57	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<5.0	<1.0	<1.0	<2.0	<1.0	<1.0	-	<1.0	<1.0
14144-77	Oct-01	65.6	15.4	7775	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0 [′]	<2.0	<5.0	<1.0	<1.0	<2.0	<1.0	<1.0		<1.0	<1.0
	Apr-02	45.8	3.32	E 162	<1.0	3.44	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<5.0	<1.0	<1.0	<2.0	<1.0	<1.0	-	<1.0	<1.0
	Oct-02	71.6	17.0	626	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<5.0	<1.0	<1.0	<2.0	<1.0	<1.0	-	<1.0	<1.0
<u> </u>	Apr-03	5.82	1.79	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<5.0	<1.0	<1.0	<2.0	<1.0	<1.0	-	<1.0	<1.0
	Oct-03	113		1826	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<5.0	<1.0	<1.0	<2.0	<1.0	<1.0	- `	<1.0	<1.0
	Apr-04	113	10.1	77.16	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<5.0	<1.0	<1.0	<2.0	<1.0	<1.0	-	<1.0	<1.0
<u> </u>	Oct-04	70.4	26.1	4.7	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00

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Table **€** 3

Volatile Organic Compounds Detected in Groundwater

Linnton Oil Fire Training Grounds

Portland, Oregon

Notes:

- 1. Samples analyzed by EPA Method 8260 B
- 2. Only VOC compounds detected above method reporting limits are shown on Table 5
- 3. Shaded values designate concentrations that exceed RBC cleanup criteria or WQCS screening values.
- a) Compound evaluated in AGI's RI/FS Endangerment Assessment
- b) Cleanup criteria and/or screening level values not listed in documents cited
- c) Cleanup criteria is less than the method reporting limit
- d) Removed from the sampling schedule COC concentrations < method reporting limits for two consecutive sampling events
- e) Also included in Table 4 (PAHs Detected in Groundwater) as a test parameter
- f) MW-10 replaced MW-4 as a compliance monitoring well starting with the April 2001 sampling event
- g) Compound not included as a parameter in previous analytical method used
- < Indicates less than the method reporting limit
- Dup Duplicate Sample
- μg/L Micrograms per liter
- RBC Risk-based Concentrations From AGI's RI/FS Endangerment Assessment Primary Cleanup Goal
- WQCS OR Water Quality Criteria Summary: 1st value represents acute & 2nd value chronic freshwater aquatic life criteria OAR Table 20 & updated Tables 33A & C
- MCL EPA National Primary Drinking Water Regulations Maximum Contaminant Level (MCL)
- PRG EPA Region 9 Preliminary Remediation Goals for tap water (generic screening tables 11-22-00)
- NV No screening value listed

Table ♥ Ч
Dissolved Arsenic Detected in Groundwater
Linnton Oil Fire Training Grounds
Portland, Oregon

Portiana, Orego.					
Well Number	Sample Dates		enic	Criteria Fo	on Cleanup r Dissolved enic
		Dissolved > (µg/L)	Total (μg/L)	RBC µg/L	MCL μg/L
MW-1	Jul-93	28.0	NA	0.14	10
	Dec-93	12.0	18.0	}	
 	Nov-99	17.5	20.3]	
	Apr-00	12. 4	7.1]	
	Oct-00	33.1	132.0		
	Oct-00 (Duplicate)	32.6	78.8		·
	Apr-01	16.8	26.9		
	Oct-01	24.6	42.8		!
	Apr-02	6.7	10.2		· ·
	Oct-02	19.8	29.5		
	Apr-03	11.4	31.0		
	Oct-03	15.9	22.7		
	Apr-04	7.5	23.3		
	Oct-04	22.7	33.8		
MW-2	Jul-93	87.0	NA		
	Dec-93	65.0	95.0		
	Dec-93 (Duplicate)	69.0	78.0		
	Nov-99	74.4	81.5	,	
	Apr-00	· 51.7	65.9		
· [Oct-00	99.8	106.0		
	Apr-01 .	62.6	101.0		
	Oct-01	76.4	142.0 ·		
	Apr-02	58.2	60.7		
	Oct-02	70.0	115.0	.	
·	Apr-03	24.8	54.3]
	Apr-03 (Duplicate)	22.2	56.6		
	Oct-03	39.8	107.0		
	Apr-04	34.2	68.8	l	
	Oct-04	78.3	99.5		
MW-4	Oct-04	0.66	4.73		j

5-Year Review Data Tables REV 4-6-05.xls

Table ♥ 4
Dissolved Arsenic Detected in Groundwater
Linnton Oil Fire Training Grounds
Portland, Oregon

Portiana, Orego	· · · · · · · · · · · · · · · · · · ·				
	Sampl e -Date		enic (r Dissolved)
		Piesolvės (mg/jūž	figal:	RB © jigµ	M@rus\it
MW-5	Dec-93	7.0	· 25.0	0.14	10
	Nov-99	18.4	26.2		
Ĭ	Apr-00	23.5	25.4		
	Oct-00	26.6	50.2		
	Apr-01	23.9	25.3	} .	
	Oct-01	15.3	46.4]	
	Oct-01 (Duplicate)	15.4	44.1]	
·	Apr-02	36.4	36.5		
	Oct-02	21.6	50.4		
	Oct-02 (Duplicate)	18.2	38.0] .	
	Apr-03	18.9	34.6	1	
	Oct-03	12.7	27.8]	,
	Apr-04	17.8	31.5 、		
•	Oct-04	18.8	25.5]	
· · · · · · · · · · · · · · · · · · ·	Oct-04 (Duplicate)	26.7	28.0	·	
MW-7	Oct-04	0.73	5.56		
MW-8	Oct-04	2.62	6.42		
MW-9	Jul-93	5.0	NA		
	Dec-93	<5	15.0		
	Nov-99 .	14.7	23.6		ı:
	Apr-00	7.0	10.2		
	Oct-00	7.8	9.7		
	Apr-01	6.64	8.1	(
·	Oct-01	4.9	7.1		
	Apr-02	11.8	15.0		· ,
	Apr-02 (Duplicate)	11.9	13.8		
	Oct-02	5.54	7.22		
	Apr-03	1.49	1.94	·	
	Oct-03	4.47	7.29		
	Apr-04	6.44	14.60	. [
	Oct-04	8.75	8.95		

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Table ¶ 4
Dissolved Arsenic Detected in Groundwater
Linnton Oil Fire Training Grounds
Portland, Oregon

Portialid, Orego				<u> </u>	
Wall Number	# SampleDate since	Ars	enic Market 1 de	Comparis Ceriteria Fo	on Cleanup r Dissolved enic
		Dissolved (m/1)	910(A)		MGNing/p
MW-10	Dec-93	<5	11.0	0.14	10
	Apr-01	1.58	2.8		
	Oct-01	1.60	4.1		
1	Apr-02	1.54	1.9]	
	Oct-02	1.80	2.35		
	Apr-03	3.35	6.67	·	
· ·	Oct-03	2.00	2.65		
	Apr-04	1.55	1.98		
	Oct-04	1.97	2.84		
MW-11	Oct-04	0.98	12.50		
MW-12	Oct-04	0.73	2.79		
MW-13	Nov-99	31.0	90.8	`	
	Apr-00	67.4	124.0		
	Oct-00	97.4	156.0		
	Apr-01	66.8	79.1		
	Oct-01	112.0	147.0		•
	Apr-02	42.3	55.0		
, , ,	Oct-02	60.8	126.0		
• •	Apr-03	14.3	55.6		
	Oct-03	. 26.3	88.2	٠,	
	Oct-03 (Duplicate)	27.2	88.1		
·	Apr-04	13.4	41.9		
	Apr-04 (Duplicate)	15.3	43.2		
	Oct-04	70.4	97.2		

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Table ♥ 4
Dissolved Arsenic Detected in Groundwater
Linnton Oil Fire Training Grounds
Portland, Oregon

Well Number	Sample Date: 1		enic II.	Giteria Fo	enic
		e Dissolved = c (Ug/L): \$	Tioral ((IIP/L)	RBC[µg/]L	MœLjig/L
MW-14	Nov-99	0.95	6.53	0.14	10
	Nov-99 (Duplicate)	0.89	6.12		ļ
	Apr-00	1.56	2.43		
	Apr-00 (Duplicate)	1.51	2.16		
	Oct-00	2.65	12.6		
•	Apr-01	0.74	1.73		
	Apr-01 (Duplicate)	0.63	1.58		
	Oct-01	1.60	4.01	•	
. [Apr-02	0.44	1.81		·
	Oct-02	0.76	2.48		
	Apr-03	0.63	1.08	i	
	Oct-04	1.21	3.04		·
	Apr-04	0.31	0.53		
·	Oct-04	1.72	4.02		

Notes:

Test Method - Samples analyzed by EPA Method 200.8

< Indicates less than the method reporting limit

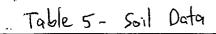
μg/L Micrograms per liter

NA Not analyzed

RBC Risk-based Concentrations From AGI's RI/FS - Primary Cleanup Goals

MCL Federal Drinking Water Standard Maximum Contaminant Level included for comparison. Revised to $10\,\mu\text{g/L}$ in 2001

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Soil Sampling 11/14/02 (continued)		Samp	e Location		DEQ Level II Screening Level	DEQ Risk- Based Concentrations	EPA Preliminary Remediation Goals
Test Parameter	SOIL1 (ug/kg)	SOIL2 (ug/kg)	SOIL3 (ug/kg)	SOIL4 (ug/kg)	Most Stringent	Residential Soil (ug/kg)	Residential Soil
•	(49/1/9/	(ug/itg)	(49/19)	(49/19)	(ug/kg)	(agrig)	(ug/kg)
Acenaphthylene	<mrl< td=""><td>35.3</td><td>83.2</td><td>81.6</td><td>n/a</td><td>n/a</td><td>n/a</td></mrl<>	35.3	83.2	81.6	n/a	n/a	n/a
Anthracene .	540	124	220	102	n/a	21,000,000	n/a
Benzo(a)anthracene	187	254	593	611	n/a	620	n/a
Benzo(a)pyrene	187	528	1230	1340	n/a .	62	n/a
Benzo(b)fluoranthene	275	384	824	1020	n/a	620	n/a
Benzo(ghi)perylene	491	798	1710	2060	n/a	n/a	n/a
Benzo(k)flouranthene	530	345	787	808	n/a	6,200	n/a
Chrysene	226	314	736	821	n/a	62,000	n/a
Dibenzo(a,h)anthracene	<mrl< td=""><td>76.9</td><td>237</td><td>262</td><td>n/a</td><td>62</td><td>n/a</td></mrl<>	76.9	237	262	n/a	62	n/a
Flouranthene	216	361	890	938	n/a	2,300,000	n/a
Fluorene	<mrl< td=""><td><mrl< td=""><td>21.0</td><td>24.9</td><td>30,000</td><td>2,600,000</td><td>n/a</td></mrl<></td></mrl<>	<mrl< td=""><td>21.0</td><td>24.9</td><td>30,000</td><td>2,600,000</td><td>n/a</td></mrl<>	21.0	24.9	30,000	2,600,000	n/a
Indeno(1,2,3-cd)pyrene	<mrl< td=""><td>635</td><td>1450</td><td>1650</td><td>n/a</td><td>620</td><td>n/a</td></mrl<>	635	1450	1650	n/a	620	n/a
Naphthalene	<mrl< td=""><td>24.6</td><td>52.1</td><td>55.5</td><td>10,000</td><td>34,000</td><td>n/a</td></mrl<>	24.6	52.1	55.5	10,000	34,000	n/a
Pentachlorophenol	6870	770	788	386	3,000	n/a	3,000
Phenanthrene	<mrl< td=""><td>183</td><td>396</td><td>431</td><td>n/a</td><td>n/a</td><td>n/a</td></mrl<>	183	396	431	n/a	n/a	n/a
Pyrene	481	588	1160	1240	n/a	1,700,000	n/a

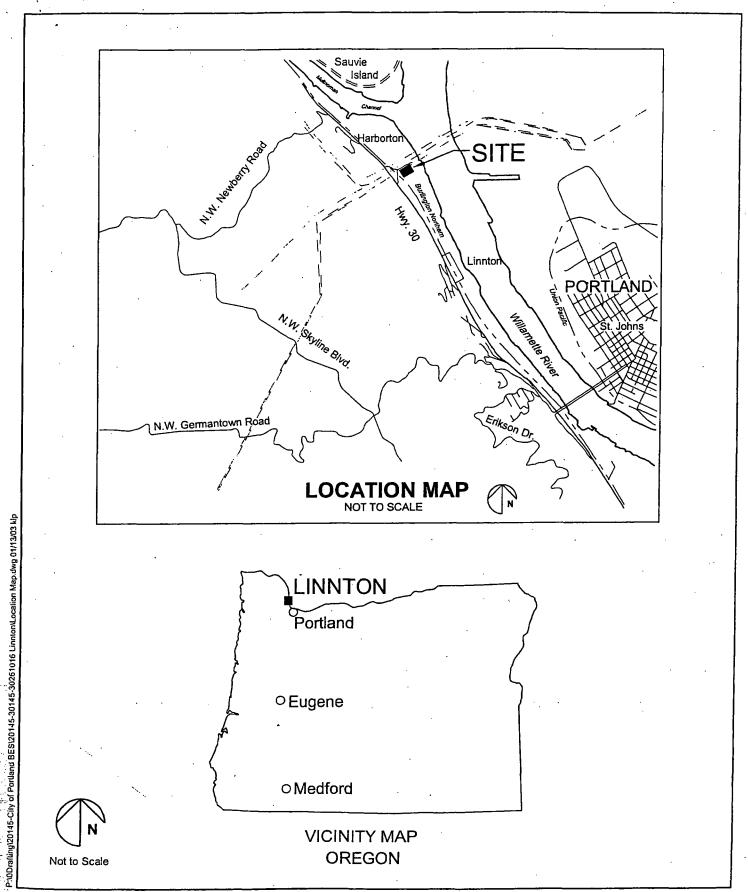
MRL = Method Reporting Limit. For individual MRL values, refer to Laboratory Analysis Reports.

Soil Sampling 11/7/03			Sample	Location			DEQ Level II Screening Level	DEQ Risk- Based Concentrations	EPA Preliminary Remediation Goals
Test Parameter	LOFTG1	LOFTG5	LOFTG6	LOFTG7	LOFTG8	LOFTG9	Most Stringent	Residential Soil	Residential Soil
	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Acenaphthene	<mrl< td=""><td><mrl< td=""><td><mrl< td=""><td><mrl< td=""><td><mrl< td=""><td><mrl< td=""><td>20,000</td><td>2,900,000</td><td>n/a</td></mrl<></td></mrl<></td></mrl<></td></mrl<></td></mrl<></td></mrl<>	<mrl< td=""><td><mrl< td=""><td><mrl< td=""><td><mrl< td=""><td><mrl< td=""><td>20,000</td><td>2,900,000</td><td>n/a</td></mrl<></td></mrl<></td></mrl<></td></mrl<></td></mrl<>	<mrl< td=""><td><mrl< td=""><td><mrl< td=""><td><mrl< td=""><td>20,000</td><td>2,900,000</td><td>n/a</td></mrl<></td></mrl<></td></mrl<></td></mrl<>	<mrl< td=""><td><mrl< td=""><td><mrl< td=""><td>20,000</td><td>2,900,000</td><td>n/a</td></mrl<></td></mrl<></td></mrl<>	<mrl< td=""><td><mrl< td=""><td>20,000</td><td>2,900,000</td><td>n/a</td></mrl<></td></mrl<>	<mrl< td=""><td>20,000</td><td>2,900,000</td><td>n/a</td></mrl<>	20,000	2,900,000	n/a
Acenaphthylene	<mrl< td=""><td><mre< td=""><td>32.2</td><td>68.4</td><td><mrl< td=""><td><mrl< td=""><td>n/a</td><td>n/a</td><td>n/a</td></mrl<></td></mrl<></td></mre<></td></mrl<>	<mre< td=""><td>32.2</td><td>68.4</td><td><mrl< td=""><td><mrl< td=""><td>n/a</td><td>n/a</td><td>n/a</td></mrl<></td></mrl<></td></mre<>	32.2	68.4	<mrl< td=""><td><mrl< td=""><td>n/a</td><td>n/a</td><td>n/a</td></mrl<></td></mrl<>	<mrl< td=""><td>n/a</td><td>n/a</td><td>n/a</td></mrl<>	n/a	n/a	n/a
Anthracene	<mrl< td=""><td><mrl< td=""><td>97.0</td><td>113</td><td><mrl< td=""><td><mrl< td=""><td>n/a</td><td>21,000,000</td><td>n/a</td></mrl<></td></mrl<></td></mrl<></td></mrl<>	<mrl< td=""><td>97.0</td><td>113</td><td><mrl< td=""><td><mrl< td=""><td>n/a</td><td>21,000,000</td><td>n/a</td></mrl<></td></mrl<></td></mrl<>	97.0	113	<mrl< td=""><td><mrl< td=""><td>n/a</td><td>21,000,000</td><td>n/a</td></mrl<></td></mrl<>	<mrl< td=""><td>n/a</td><td>21,000,000</td><td>n/a</td></mrl<>	n/a	21,000,000	n/a
Benzo(a)anthracene	<mrl< td=""><td>13.4</td><td>56.9</td><td>274</td><td>13.4</td><td><mrl ,<="" td=""><td>n/a</td><td>620</td><td>n/a</td></mrl></td></mrl<>	13.4	56.9	274	13.4	<mrl ,<="" td=""><td>n/a</td><td>620</td><td>n/a</td></mrl>	n/a	620	n/a
Benzo(a)pyrene	18.7	20.4	80.7	653	<mrl< td=""><td><mrl< td=""><td>n/a</td><td>62</td><td>n/a .</td></mrl<></td></mrl<>	<mrl< td=""><td>n/a</td><td>62</td><td>n/a .</td></mrl<>	n/a	62	n/a .
Benzo(b)fluoranthene	15.2	16.2	76.1	464	<mrl< td=""><td><mrl< td=""><td>n/a</td><td>620</td><td>n/a</td></mrl<></td></mrl<>	<mrl< td=""><td>n/a</td><td>620</td><td>n/a</td></mrl<>	n/a	620	n/a
Benzo(ghi)perylene	23.8	20.1	245	1110	<mrl< td=""><td><mrl< td=""><td>n/a</td><td>n/a</td><td>n/a</td></mrl<></td></mrl<>	<mrl< td=""><td>n/a</td><td>n/a</td><td>n/a</td></mrl<>	n/a	n/a	n/a
Benzo(k)flouranthene	<mrl< td=""><td><mrl< td=""><td>59.7</td><td>420</td><td><mrl< td=""><td><mrl< td=""><td>n/a</td><td>6,200</td><td>n/a</td></mrl<></td></mrl<></td></mrl<></td></mrl<>	<mrl< td=""><td>59.7</td><td>420</td><td><mrl< td=""><td><mrl< td=""><td>n/a</td><td>6,200</td><td>n/a</td></mrl<></td></mrl<></td></mrl<>	59.7	420	<mrl< td=""><td><mrl< td=""><td>n/a</td><td>6,200</td><td>n/a</td></mrl<></td></mrl<>	<mrl< td=""><td>n/a</td><td>6,200</td><td>n/a</td></mrl<>	n/a	6,200	n/a
Chrysene	14.4	17.4	77.0	404	<mrl< td=""><td><mrl< td=""><td>n/a</td><td>62,000</td><td>n/a</td></mrl<></td></mrl<>	<mrl< td=""><td>n/a</td><td>62,000</td><td>n/a</td></mrl<>	n/a	62,000	n/a
Dibenzo(a,h)anthracene	<mrl< td=""><td><mrl< td=""><td><mrl< td=""><td>133</td><td><mrl< td=""><td><mrl< td=""><td>n/a</td><td>62</td><td>n/a</td></mrl<></td></mrl<></td></mrl<></td></mrl<></td></mrl<>	<mrl< td=""><td><mrl< td=""><td>133</td><td><mrl< td=""><td><mrl< td=""><td>n/a</td><td>62</td><td>n/a</td></mrl<></td></mrl<></td></mrl<></td></mrl<>	<mrl< td=""><td>133</td><td><mrl< td=""><td><mrl< td=""><td>n/a</td><td>62</td><td>n/a</td></mrl<></td></mrl<></td></mrl<>	133	<mrl< td=""><td><mrl< td=""><td>n/a</td><td>62</td><td>n/a</td></mrl<></td></mrl<>	<mrl< td=""><td>n/a</td><td>62</td><td>n/a</td></mrl<>	n/a	62	n/a
Flouranthene	21.0	24.8	90.2	372	<mrl< td=""><td><mrl< td=""><td>n/a</td><td>2,300,000</td><td>n/a</td></mrl<></td></mrl<>	<mrl< td=""><td>n/a</td><td>2,300,000</td><td>n/a</td></mrl<>	n/a	2,300,000	n/a
Fluorene	<mrl< td=""><td><mrl< td=""><td><mrl< td=""><td><mrl .<="" td=""><td><mrl< td=""><td><mrl< td=""><td>30,000</td><td>2,600,000</td><td>n/a</td></mrl<></td></mrl<></td></mrl></td></mrl<></td></mrl<></td></mrl<>	<mrl< td=""><td><mrl< td=""><td><mrl .<="" td=""><td><mrl< td=""><td><mrl< td=""><td>30,000</td><td>2,600,000</td><td>n/a</td></mrl<></td></mrl<></td></mrl></td></mrl<></td></mrl<>	<mrl< td=""><td><mrl .<="" td=""><td><mrl< td=""><td><mrl< td=""><td>30,000</td><td>2,600,000</td><td>n/a</td></mrl<></td></mrl<></td></mrl></td></mrl<>	<mrl .<="" td=""><td><mrl< td=""><td><mrl< td=""><td>30,000</td><td>2,600,000</td><td>n/a</td></mrl<></td></mrl<></td></mrl>	<mrl< td=""><td><mrl< td=""><td>30,000</td><td>2,600,000</td><td>n/a</td></mrl<></td></mrl<>	<mrl< td=""><td>30,000</td><td>2,600,000</td><td>n/a</td></mrl<>	30,000	2,600,000	n/a
Indeno(1,2,3-cd)pyrene	16.2	14.2	173	759	<mrl< td=""><td><mrl< td=""><td>n/a</td><td>620</td><td>n/a</td></mrl<></td></mrl<>	<mrl< td=""><td>n/a</td><td>620</td><td>n/a</td></mrl<>	n/a	620	n/a
Naphthalene	<mrl< td=""><td><mrl< td=""><td><mrl< td=""><td><mrl< td=""><td><mrl< td=""><td><mrl< td=""><td>10,000</td><td>34,000</td><td>n/a</td></mrl<></td></mrl<></td></mrl<></td></mrl<></td></mrl<></td></mrl<>	<mrl< td=""><td><mrl< td=""><td><mrl< td=""><td><mrl< td=""><td><mrl< td=""><td>10,000</td><td>34,000</td><td>n/a</td></mrl<></td></mrl<></td></mrl<></td></mrl<></td></mrl<>	<mrl< td=""><td><mrl< td=""><td><mrl< td=""><td><mrl< td=""><td>10,000</td><td>34,000</td><td>n/a</td></mrl<></td></mrl<></td></mrl<></td></mrl<>	<mrl< td=""><td><mrl< td=""><td><mrl< td=""><td>10,000</td><td>34,000</td><td>n/a</td></mrl<></td></mrl<></td></mrl<>	<mrl< td=""><td><mrl< td=""><td>10,000</td><td>34,000</td><td>n/a</td></mrl<></td></mrl<>	<mrl< td=""><td>10,000</td><td>34,000</td><td>n/a</td></mrl<>	10,000	34,000	n/a
Pentachlorophenol	67.5	<mrl< td=""><td>1080</td><td>858</td><td><mrl< td=""><td><mrl< td=""><td>3,000</td><td>n/a</td><td>3,000</td></mrl<></td></mrl<></td></mrl<>	1080	858	<mrl< td=""><td><mrl< td=""><td>3,000</td><td>n/a</td><td>3,000</td></mrl<></td></mrl<>	<mrl< td=""><td>3,000</td><td>n/a</td><td>3,000</td></mrl<>	3,000	n/a	3,000
Phenanthrene	<mrl< td=""><td><mrl< td=""><td>64.1</td><td>159</td><td><mrl< td=""><td><mrl< td=""><td>n/a</td><td>n/a</td><td>n/a</td></mrl<></td></mrl<></td></mrl<></td></mrl<>	<mrl< td=""><td>64.1</td><td>159</td><td><mrl< td=""><td><mrl< td=""><td>n/a</td><td>n/a</td><td>n/a</td></mrl<></td></mrl<></td></mrl<>	64.1	159	<mrl< td=""><td><mrl< td=""><td>n/a</td><td>n/a</td><td>n/a</td></mrl<></td></mrl<>	<mrl< td=""><td>n/a</td><td>n/a</td><td>n/a</td></mrl<>	n/a	n/a	n/a
Pyrene	27.8	34.0	125	535	<mrl< td=""><td>14.3</td><td>n/a</td><td>1,700,000</td><td>n/a</td></mrl<>	14.3	n/a	1,700,000	n/a

MRL = Method Reporting Limit. For individual MRL values, refer to Laboratory Analysis Reports.

				Table-	5				
Soil Sampling 6/30/04			Sample	Location			DEQ Level II Screening Level	Consensus Based Probable Effect Concentration	DEQ Risk-Based Concentration
Test Parameter	LOFTG10 (mg/kg)	LOFTG11 (mg/kg)	LOFTG12A (mg/kg)	LOFTG12B (mg/kg)	LOFTG13 (mg/kg)	LOFTG14 (mg/kg)	Most Stringent (mg/kg).	MacDonald, et al, 2000 (mg/kg)	Residential Soil (mg/kg)
Pentachlorophenol	<0.067	<0.067	<0.067	<0.134	<0.067	<0.067	3	1*	n/a
Acenaphthene	< 0.0134	< 0.0134	<0.0134	<0.268	<0.0134	<0.0134	. 20	n/a	2,900
Acenaphthylene	< 0.0134	< 0.0134	<0.0134	<0.268	<0.0134	<0.0134	n/a	n/a	n/a
Anthracene	< 0.0134	<0.0134	<0.0134	<0.268	<0.0134	< 0.0134	n/a	0.845	21,000
Benzo(a)anthracene	<0.0134	<0.0134	<0.0134	0.113	< 0.0134	<0.0134	n/a	1.05	0.620
Benzo(a)pyrene	<0.0134	<0.0134	<0.0134	0.163	< 0.0134	<0.0134	125	1.45	0.062
Benzo(b)fluoranthene	<0.0134	<0.0134	<0.0134	0.111	<0.0134	<0.0134	n/a	n/a	0.620
Benzo(ghi)perylene	<0.0134	<0.0134	<0.0134	0.139	<0.0134	<0.0134	n/a	n/a	n/a
Benzo(k)fluoranthene	<0.0134	<0.0134	<0.0134	0.116	<0.0134	<0.0134	n/a	n/a	6.2
Chrysene	<0.0134	<0.0134	<0.0134	0.134	<0.0134	<0.0134	n/a	1.29	62
Dibenzo(a,h)anthracene	< 0.0134	<0.0134	<0.0134	<0.268	<0.0134	<0.0134	n/a	n/a	0.062
Fluoranthene	<0.0134	<0.0134	<0.0134	0.181	<0.0134	<0.0134	n/a	2.23	2,300
Fluorene	<0.0134	<0.0134	<0.0134	<0.268	<0.0134	<0.0134	30_	0.536	2,600
Indeno(1,2,3-cd)pyrene	<0.0134	<0.0134	<0.0134	0.106	< 0.0134	<0.0134	n/a	n/a	0.62
Naphthalene	<0.0134	<0.0134	<0.0134	<0.268	<0.0134	<0.0134	10	0.561	34
Phenanthrene	<0.0134	<0.0134	< 0.0134	<0.268	<0.0134	<0.0134	n/a	1.17	n/a
Pyrene	<0.0134	<0.0134	<0.0134	0.239	< 0.0134	<0.0134	n/a	1.52	1,700
Total PAHs	n/a	n/a	n/a	1.189	n/a	n/a	n/a	22.8	n/a

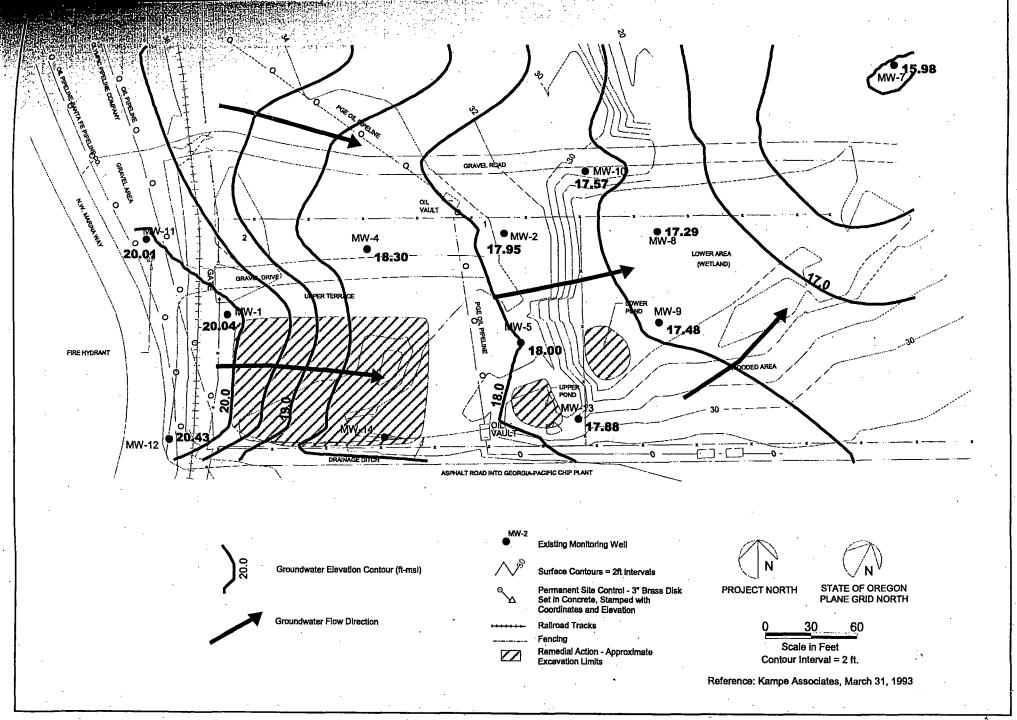
n/a = not available
* = screening level recommended by Jennifer Peterson of DEQ.



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FIGURE 1 LOCATION MAP



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LINNTON OIL FIRE TRAINING GROUNDS PORTLAND, OREGON

FIGURE \$ 3 GROUNDWATER ELEVATION MAP OCTOBER 25, 2004

